Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

U. S. FOREST SERVICE RESEARCH NOTE NE-16

1963

Northeastern Forest

FOREST SERVICE, U.S. DEPT. OF AGRICULTURE, 102 MOTORS AVENUE, UPPER DARBY, PA.

Experiment Station

U. S. DEPT OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
APR 6 1964
CURRENT SERIAL RECORDS

TIP-MOTH CONTROL FAILS TO IMPROVE HEIGHT OF PLANTED LOBLOLLY PINES IN A MARYLAND STUDY

Tip moths[1] cause conspicuous damage to loblolly pine reproduction in eastern Maryland, especially on old-field sites. As the number of old-field plantations and the value of forest crops have increased, landowners and managers have become interested in the possibility of controlling this damage and perhaps improving the form and growth of their planted trees.

However, the damage — although conspicuous — has been of questionable importance. For example, Wakeley (*4*) considered tip moths to be only a minor hazard. But on the other hand, studies of tip-moth control by a single spray treatment (*3*) or repeated sprayings (*2*) have shown that in some cases the height growth of loblolly pine can be appreciably increased by such treatments.

To help determine the value of tip-moth control in eastern Maryland, the Northeastern Station and the Maryland Department of Forests and Parks in 1959 started a study in old-field plantations that had been established between the 1957 and 1958 growing seasons. This note summarizes the effect of tip-moth control during the second to fourth growing seasons after planting, the period in which damage to planted seedlings in eastern Maryland is usually the greatest.

[1]The Nantucket pine tip moth, *Rhyacionia frustrana,* is the primary species in eastern Maryland, but other species, *R. rigidana* in particular (*1*), are probably present in limited numbers.

Study Methods

The three spray treatments originally planned for the study were designed to control, respectively, (1) the first annual brood of tip-moth larvae, (2) the first two broods, or (3) all three broods that might possibly occur in any one year. However, little evidence of a third brood was found during the 3-year period covered by this study; so the third treatment was a duplicate of the second.

For the first treatment, spraying with DDT was done once annually in early May — just before the spring emergence of tip moths. The second and third treatments consisted of an identical May spraying plus another spraying in mid-July just before the emergence of a second flight of moths. The spray was a water emulsion containing 5 percent DDT, applied with a compressed-air sprayer to individual trees.

The 4 blocks in the study were located in 4 separate fields, of 3 to 15 acres, about 3 miles east of Snow Hill in Worcester County. Three of these fields were adjacent; the fourth was about 0.5 mile from the others.

Each block contained 4 plots, 1 for each scheduled treatment and an untreated control. The plots were about 90 feet square, and each contained more than 90 living planted trees in addition to the 2 outer rows of trees that formed an isolation strip. The original spacing between the trees was about 6 by 7 feet.

At the beginning of the study, the seedlings averaged about 1 foot tall. A few seedlings that had been clipped by rabbits were about 0.5 foot, and many of the undamaged seedlings were somewhat more than a foot high.

Results and Discussion

An infestation of tip moths built up rapidly in the study areas. During the summer of 1958 — the year before control treatments began — 0.0 to 2.3 percent of all shoots (terminal and lateral) on the trees in a plot had been injured by tip moths. In 1959, 40 percent of all the tree shoots in 1 control plot were damaged by the first generation of tip-moth larvae, and the damage increased to 68 percent after the second generation had developed. The other 3 control plots showed a less rapid increase: 21 to 46 percent of the shoots were injured by the first 2 generations of larvae in 1959. However, in 1961, 79 to 100 percent of the terminal shoots on the trees in the control plots were damaged during the growing season.

Each spraying operation prevented most of the injury by the tip-moth larvae that developed shortly afterwards. These larvae usually damaged only about 3 percent of the shoots in recently treated plots. However, the

sprayings had no apparent effect upon succeeding generations or the degree of infestation in adjacent control plots.

None of the spraying treatments noticeably affected the average height of planted trees as measured in the spring of 1962, 3 years after the treatments were begun. Average height of all the stems in any treatment or the control varied from 7.4 to 8.0 feet, a difference of only 0.6 foot.

Furthermore, the treatments did not appreciably affect the form of the trees in the study. Forked and bent stems appeared at times to be more common among the damaged trees. However, so rapidly did one shoot suppress the other, and so frequently were defects in form overgrown, that no appreciable benefits in form can be attributed to the tip-moth control measures.

However, observations in eastern Maryland do indicate that in some areas tip moths can be more damaging than was observed in this study. In such areas, growth may be severely retarded for 1 or 2 years and appreciable damage to tree form may result. Wherever such severe damage appears to be developing, one or two sprayings for tip-moth control will encourage more rapid recovery of the infested pines and thus should prove to be worthwhile measures.

Literature Cited

(1) Craighead, F. C.
1949. Insect enemies of eastern forests. U. S. Dept. Agr. Misc. Pub. 657. 679 pp., illus.

(2) Foil, R. R., R. G. Merrifield, and T. Hansbrough.
1961. Results of tip moth control on height growth of loblolly pine. La. State Univ. Hill Farm Facts: Forestry 2. 5 pp., illus.

(3) Southern Forest Experiment Station.
1957. 1956 annual report. U. S. Forest Serv. South. Forest Expt. Sta. 110 pp., illus.

(4) Wakeley, Philip C.
1954. Planting the southern pines. U. S. Dept. Agr., Agr. Monog. 18. 233 pp., illus.

— H. A. SOMES and T. McINTYRE[2]

[2]Mr. Somes is a forestry research technician on the staff of the Northeastern Forest Experiment Station's research unit at New Lisbon, N. J. Mr. McIntyre, an entomologist who formerly served with the Northeastern Station, is now with the Agricultural Research Service, Plant Pest Control Division, Otis Air Force Base, Falmouth, Mass.